

Hobbies

WEEKLY

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SUPPLEMENT DESIGN
FOR SMALL
HELICOPTER MODEL

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A simple model pull-along TOY CARGO STEAMER

THE toy steamer shown here is a simple model of a cargo steamer such as ply round our coasts to the various ports. The toy is about 15ins. long, and fitted with wheels below deck, so it can be pulled along realistically.

In making the toy, the floor or lower deck A is first drawn from the plan, Fig. 1, on to a piece of $\frac{1}{4}$ in. wood, taking carefully into account the measurements shown. The sides of the steamer may be outlined and prepared from the squared diagram Fig. 2, below that of the plan.

On a piece of thin plywood veneer or stout bendable card set out a number of $\frac{1}{8}$ in. squares and through these follow carefully the dark lines of the profile of the side.

Two pieces of the plywood or card will be pinned together and cut round simultaneously to make sure that both will be exactly alike.

Inside Work

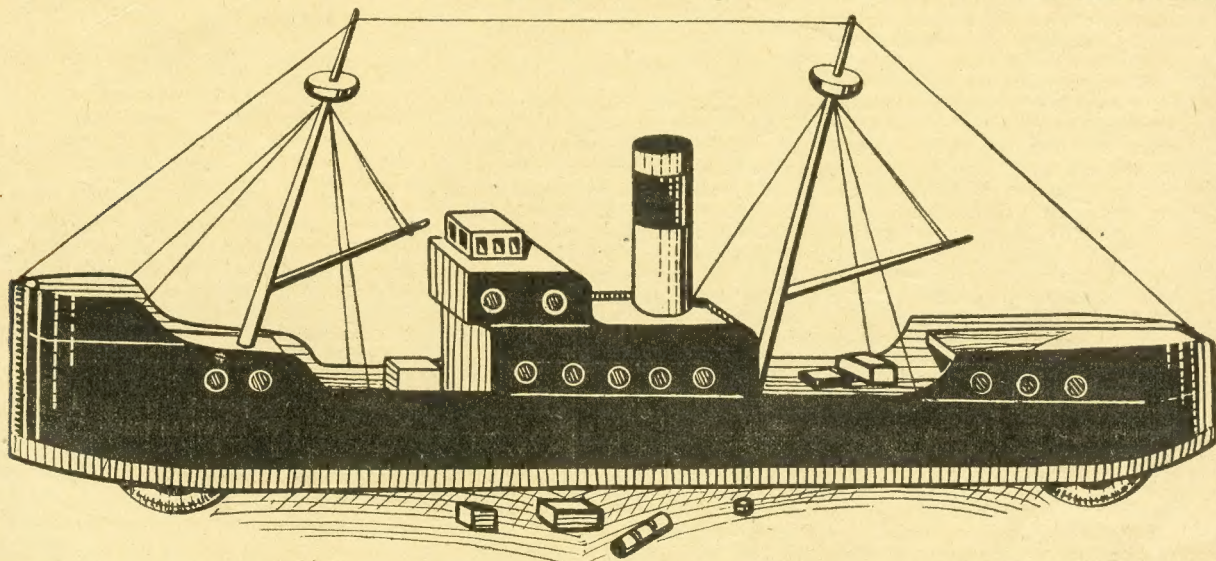
Looking at Fig. 3 we see the construction of the interior of the toy before the sides are put on. Each piece of wood lettered will be dealt with regarding size and fixing. Piece

B is the stern, $2\frac{1}{2}$ ins. long by 2ins wide and $\frac{1}{4}$ in. thick.

It is glued and nailed to the back edge of the floor A. There are two pieces C to strengthen the stern piece and to form a ledge upon which the after deck E will rest. Pieces C are $1\frac{1}{4}$ ins. by $\frac{1}{2}$ in. by $\frac{1}{4}$ in.

There are two wheel supports or bearers at D and they are $1\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. by $\frac{1}{4}$ in. The holes should be cut in these before they are cut to outline to avoid splitting. A similar pair of bearers will be required for the front wheel.

The after deck E and the fore deck



L will be drawn out by laying the floor, piece A, on to smaller pieces of $\frac{1}{4}$ in. stuff and drawing round it. A small notch will be cut in the piece L to fit round the bow post K, as seen in Fig. 3. The edges of piece B at the stern of the ship must be filed to the shape of the floor piece A before the sides can be put on.

Centre Supports

The piece H measures $2\frac{3}{4}$ ins. by 2 ins. by $\frac{1}{4}$ in. and after cutting will be glued to the deck A at a distance of $6\frac{1}{2}$ ins. from the bow. Piece F, being the middle upper deck, is glued flush with the top of H inside to give the

wheels, except that here both wheels are on the one spindle.

Pieces I and J and the funnel can be left until almost last. Piece I consists of two pieces $2\frac{3}{4}$ ins. by 1 in. and J also two pieces of odd wood about $\frac{3}{4}$ ins. square.

The wheels can next be inserted in their respective slots and pieces of round rod pushed through, as Fig. 4 shows. The wheels can be cut from some pieces of $\frac{3}{4}$ in. wood and of such a diameter that they only project a short way below the floor when fixed on their spindles. It would be best to test the diameter of the wheels direct from the model, the circles

prepared for bending, slightly chamfer the upright edges where they meet the post K. Coat the edges of the floor and those of the three upper decks and commence bending round, starting at the bow and pinning the pieces to the decks.

Side Covering

Bring round the two sides to meet the stern piece B and the pieces C and, having pinned them securely, trim off any unwanted plywood or card at the end. Glasspaper all the parts after the glue has set hard.

The funnel is made from $\frac{3}{4}$ in. round rod 3 ins. long, and cut square at each

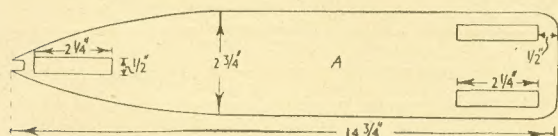


Fig. 1—Outline and measurements of lower deck

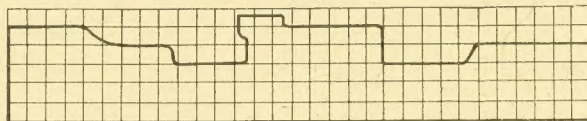


Fig. 2—Outline of side covers marked on $\frac{1}{2}$ in. squares

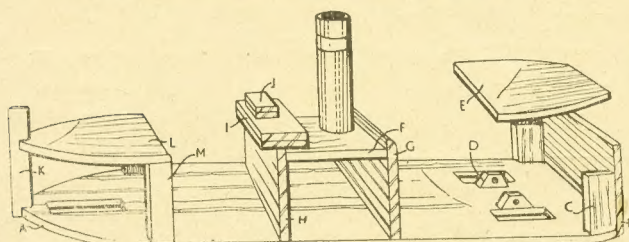


Fig. 3—General view showing actual construction



Fig. 4—Underview of wheel fixing

can then be described with compasses direct on the wood.

They should, however, be about $1\frac{1}{2}$ ins. in diameter.

The bow piece K is $2\frac{3}{4}$ ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{4}$ in. thick. There are two uprights M and they each measure $1\frac{1}{2}$ ins. by $\frac{1}{2}$ in. wide by $\frac{1}{4}$ in. thick.

Now for the sides of the ship. Having the two pieces cut and

end. The two masts are $4\frac{1}{2}$ ins. long and shaped up from $\frac{3}{16}$ in. rod. The two booms will also be of $\frac{3}{16}$ in. rod tapered off and held to the masts by small wire staples or screw eyes.

Two small discs may be added to the masts as shown and the rigging should be of fine cord fastened to quite small screw eyes.

Paint the decks of the ship stone colour or buff and line them up with pencil or ink to represent the deck planking. The funnel should be buff with either a red or black band. The masts and booms are also buff. The sides of the ship should be painted black, with red for the waterline. The wheels also should be red. Paint the portholes with a white rim and blue centres.

proper position of the upright G which measures $2\frac{3}{4}$ ins. by $2\frac{1}{2}$ ins. by $\frac{1}{4}$ in.

It should be mentioned that the front pair of wheel bearers, D, will be glued on, one each side of the slot shown. The wheel thus works in the slot somewhat like the rear pair of

Some Helpful Ideas

CARBON paper can be slightly rejuvenated for a little further use by warming it for a few moments in front of a gentle heat.

When you wish to trace a drawing from one sheet of paper to another a convenient method is to rub a lead pencil over the back of the original. An impression will then be made by placing it on top of the blank sheet and tracing over the outline.

If your rubber keeps getting mislaid why not keep track of it with a piece of string—one end attached to the rubber, the other to the drawing board or table?

To avoid indenting the paper or wood when marking circles with a compass, stand the point of the inner arm on a small slip of card.

A small piece of glasspaper may well be kept handy when drawing up designs. Whenever a really fine point is required the pencil may then be given a few rubs after sharpening.

For marking straight lines along a wall or floor, chalk a length of string

and, with someone holding it taut at each end, raise it at the middle and let it spring back to leave a chalk mark.

Matchbox Villa

A GOOD use for matchboxes is, of course, the making of miniature furniture for the kiddies to play with. Sideboards, tables, sink units, bookshelves, and so on can all be made up from such boxes.

One model maker, however, aims to go further than this. When sufficient empty matchboxes have accumulated, his project is to build a complete doll's house, using the boxes as miniature bricks.

By slipping out the inner trays half way, the rows of boxes can be slotted into each other and firmly glued to make a firm job, and the layers of "bricks" will also be glued. A realistic porch, chimney stacks, floors, stairs, in fact, almost the whole house will be constructed from matchboxes.

The only difficulty these days is

getting together a sufficient number for such a big project.

Fresh Rabbit Food

GROWING wild in the hedgerow is an abundance of food your rabbits will enjoy. To mention three of those most readily obtainable—groundsel, dandelion, and plantain—are all excellent. But there are certain plants to avoid, including the buttercup and bluebell.

From the garden, fresh young lawn mowings can be fed, and a supply may also be dried in the sun, rubbed up into coarse meal, and stored in bags or tins for winter. Young dried nettles may be put in the hutch.

Greenstuff, provided it is young and fresh, and, of course, clean, is valuable for the health of rabbits, and good use should be made of any wholesome waste from the kitchen. They will appreciate the leaves of cabbage and sprouts, and any roots such as swedes or carrots. Rhubarb leaves should always be avoided.

The Craftsman

Lift the pen and the inkwell lid rises in this novel AUTOMATIC INKSTAND

It is most annoying to find that just when you want to use the ink, that the lid has been left off and the liquid has evaporated, or a lot of dirt has got in. The inkstand described will save all this trouble, because when you have finished writing and place the pen down on the tray, the lid of the ink container is automatically closed. The act of lifting up the pen again reopens the lid ready for work.

Such an inkstand would be a very welcome addition in the home or office, and besides being a fascinating novelty its construction should not present any difficulty to the handyman. In addition to the inkwell in the centre, there is a small hinged compartment on either side for india rubber, pen nibs and paper clips.

How it Works

Now for just a brief description of how it works. When the pen is lifted from the tray marked A in Fig. 1, the front part of the lever B will be lighter and will therefore rise, making a corresponding fall in the back part. This action, transmitted through the wire D pulls open the lid of the inkwell. When the pen is replaced, this operation is reversed, its weight on the tray being sufficient to cause the lid to fall.

It does not matter what kind of wood is used for the construction, although a hardwood such as mahogany or walnut would make up and

are different you must vary your measurements accordingly.

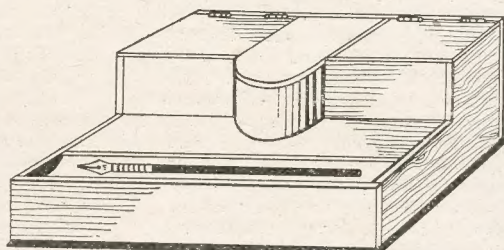
A piece of wood 7ins. long, $3\frac{1}{8}$ ins. wide and $\frac{3}{8}$ in. thick is required to hold the ink jar and the mechanism. The entire case is built around this foundation piece. If you have to drill the exact size of the jar it will simplify the work, but if not, a circular hole is cut out with gouge and chisel to a depth of $\frac{1}{4}$ in. The jar must be a tight fit in this.

The Mechanism

The next job is to make and fix up the mechanism that operates the opening and closing of the lid. It would be as well at this point to cut and fix the sides to the foundation board so as to form a stand. This will enable you to get at the mechanism and to make whatever adjustments are necessary for its smooth running.

For these sides, cut two pieces of $\frac{1}{2}$ in. wood, 4ins. long and $2\frac{3}{8}$ ins. wide at the back and stepped as shown, the front part being $1\frac{3}{8}$ ins. wide. These are glued in such a position that there is 1in. clearance beneath the foundation board for the lever to operate. Corner blocks can also be glued under this board where it joins the sides for extra strength, if you think it necessary.

Now we are ready to cut out the parts for the lid-operating mechanism. The 'floating' tray A for the pen can



by measuring back from the front edge of the foundation board a distance of $\frac{3}{8}$ in.—this gives the centre of the block or in line with the pivot hole.

A piece of thin wire is used for the pivot which is made a tight fit in the lever, while the holes in the pivot block are slightly larger to enable the lever to move up and down easily. It is necessary to make this pivot with care as the success of the whole mechanism depends on the easy working of this joint.

The Tray Piece

When the lever and pivot block are fixed and the glue set, the tray block can be cut to length and glued in position. To find the length of the block, the front of the lever is pressed down as far as it will go, and the measurement taken—it should be between $\frac{3}{8}$ in. and $\frac{1}{2}$ in.

Cut and fix it so the edge of the tray is level with and just free of the front edge of the foundation board. As the lever moves up and down, the tray must swing clear of the board.

The next part to make is the support for the lid (see Fig. 4), which is $1\frac{1}{2}$ in. long $\frac{1}{2}$ in. wide and $\frac{1}{2}$ in. thick. If, however, your inkwell is of a different height to the one shown, you must vary your measurements to suit. A slot is cut slightly more than $\frac{1}{4}$ in. wide in the top to form the lid hinge. It will be noticed that this is rounded off at the back to enable the lid to swing open easily. The support is glued in position immediately behind the ink jar. Two panel pins can be driven in from underneath to make a more rigid joint.

The Lid

The lid is cut from wood $\frac{1}{8}$ in. thick and is made to overlap the jar $\frac{1}{8}$ in. You will therefore want a piece of wood 2ins. wide with the length about $2\frac{3}{8}$ ins. This allows for a slight gap at the back to enable the lid to open without touching the back of the stand. In order to make the hinge on the lid, a piece of $\frac{1}{4}$ in. square wood is glued to the underside as shown at F in Fig. 1. Its length is $\frac{3}{8}$ in. and it can be tapered just a little towards the back.

Two tiny screw eyes are now

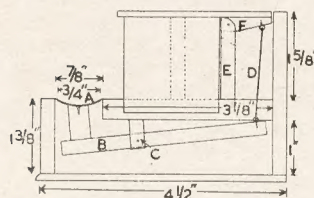


Fig. 1—An end section

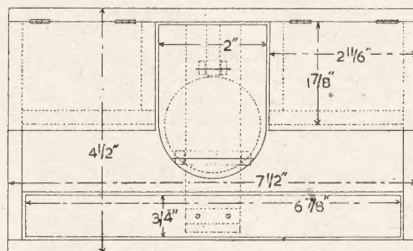


Fig. 2—Plan view of all the parts

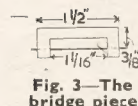


Fig. 3—The bridge piece

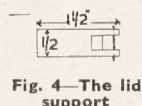


Fig. 4—The lid support

polish nicely. Plywood could be used but as you will want to show it off to your friends, something more dignified should be used. The plan at Fig. 2 shows, with Fig. 1, dimensions of various parts needed.

The first thing is to find a suitable container for the ink—the one used by the writer was an old vanishing cream jar having an outside diameter of $1\frac{3}{8}$ ins. and a height of $1\frac{1}{8}$ ins. There are many other types of jars which could be used, but if the sizes

be made either in metal or plastic material bent to form a shallow trough. It is $6\frac{1}{8}$ ins. long and $\frac{1}{2}$ in. wide. Two holes are drilled and countersunk to take the small screws needed to fix it to the wood block on lever B.

This lever is $3\frac{3}{8}$ ins. long, 1in. wide and $\frac{1}{8}$ in. thick, and is pivoted at C which is one third the distance from the tray block to the wire loop at the back.

To make the pivot, a bridge-shaped piece of wood is cut as shown in Fig. 3. The pivot hole is $\frac{3}{8}$ in. down from where it is glued to the underside of the foundation board. The position of the pivot block is found

screwed in—one at the back of the lever B and the other at the back of the lid. These two eyes are connected together with a piece of wire making a neat loop at each end. The wire should be just thick enough to slide easily in the eyes.

If you cannot get screw eyes small enough, it is an easy matter to turn up an end of wire and make them yourself. Of course, you must make only small holes for them in the wood so that they can be driven in tight.

A little careful measuring and patience will be required in order to get the connecting wire the right length. When the lid is closed, the edges of the pen tray must be level with the top of the foundation board.

The next job, and it is rather an important one, is to balance the

mechanism. Owing to the fact that you may be using different materials from those used by the writer, their weights may therefore be different, and the mechanism will not balance correctly.

Obtaining the Balance

The way to do this is to cut small blocks of wood and glue to the sides of the lever B, either at the back or front, whichever is necessary. Suppose you have used a thick piece of metal for the pen tray and it is too heavy to open the lid when the pen is lifted—you will want more weight fixed to the back of the lever to balance this out. The same applies if the lid is too heavy. Do not glue the blocks all on one side of the lever, but cut them in half and put some

on each side.

The remainder of the job is easy and little description is necessary. The back and front are cut from $\frac{1}{4}$ in. wood, as are also the sides and fronts of the two side compartments.

Wood $\frac{1}{4}$ in. thick is ample for the base, which is cut to overlap about $\frac{1}{8}$ in. It would be advisable to screw this on, so it can easily be removed if anything goes wrong with the mechanism. The compartment lids are also $\frac{1}{4}$ in. thick and are fixed with two small hinges to the back.

Having now got this novelty working smoothly and to your entire satisfaction, it will pay to put a neat finish to it. The best of course, is to french polish it, but you may like to use a stain and varnish, or an ebony finish would look nice.

Hints on how the radio amateur should take care to AVOID MAINS SHOCKS

WITH all mains-operated equipment (motors, lamps, chargers, amplifiers, radio receivers, and so on) the fairly high voltage present results in there being some danger from shocks. These dangers have always been mentioned in articles dealing with mains apparatus, but it is thought readers would like to have them treated in greater detail.

How Serious

It is generally considered that 400 volts is the average minimum likely to cause death, and house supplies in this country are usually 220 to 250 volts. Many persons who have experienced shocks from such supplies by touching bare connections will know that the result is a sharp tingling.

The extent of the shock always depends upon the degree of contact between the person and the supply. For example, if a metal tool is held in the hand and touched on a supply, the shock will be much more severe than if the tip of a finger is touched on the same supply.

Moisture causes a better contact and it has been known for an ordinary house supply to cause death where the shock has been severe (e.g. from washing-machines or irons) or the person in ill health. So no one takes risks of shocks unnecessarily.

Completing the Circuit

A shock can only be experienced when the person's body completes a circuit. This may be from one hand to the other, or perhaps from one hand to the feet. It is quite usual for electrical engineers to work on mains apparatus which is connected up and

working and usually they stand on a carpet or other good insulator and use *one hand only*. Under such conditions the chances of a shock are slight and any shocks felt will generally be mild.

But for the amateur, the safeguard often recommended in these pages is advised—never touch any bare leads or parts without first withdrawing the mains plug to disconnect the supply.

Damp Floors

One mains supply lead is almost always earthed at some point. Because of this, the circuit may be completed through a concrete or other damp or conductive floor and the person's feet. If work on apparatus connected to the mains *must* be done under such conditions it will help to stand on a dry box or other insulator.

Radios and Amplifiers

In the usual AC/DC design the power supply is connected to the metal chassis of these. So if the user touches the chassis or any metal parts secured to it he may feel a shock if the circuit is completed through his body as described. In radio sets in particular, many joints and parts are necessary, and it is always recommended these be enclosed in a cabinet when completed. This will offer complete protection provided all the control knobs are of the proper insulated type, and a back is fitted to the cabinet.

If any extension speaker or other fitment is added to a receiver the same danger applies to it and to its connections. This brings up an important rule—always use proper insulated wire and the proper adaptors, etc., intended for mains use,

instead of dangerous hook-ups made from oddments.

Earthing

Many houses now have a 3-socket mains supply. Here, the large pin on the plug is earthed and this is connected to the metal frame of electric irons, washing-machines, etc. If this connection is good the framework of these machines cannot develop a high voltage in relation to earth. The user can therefore touch them with no danger.

Where no such earth is provided a voltage could exist between the metal framework and earth, providing a shock through the user's feet. The only safeguard here is to avoid damp or conductive floors. In addition, one side of the supply is usually at lower potential relative to earth, and this should be the one which is connected to any metalwork—(the chassis of a radio set).

Disconnecting

All this may appear to suggest mains-operated equipment is highly-dangerous. However, there is one golden rule which removes all danger—never touch any bare parts without first disconnecting the apparatus from the mains.

Radio receivers and similar apparatus can be wired up completely before plugging into the supply. If any adjustments to wiring are required, then the mains plug can be withdrawn before commencing them.

It is not usually sufficient merely to switch off the mains with the switch provided because this is generally included in one lead only. Therefore the mains are still connected through the second lead, so that the apparatus is, not really safe to handle.

Simple parts and easy construction in these SMALL TOY TRACTORS

ONLY a few years ago all our big road transport was carried out by steam traction engines. They pulled threshing machines, brought our fairs and were to be seen on the highways with every conceivable load from stones to furniture. Now this imposing machine has practically disappeared, its place being taken by motor tractors—oil or petrol driven. Many were sorry to see the steam traction engine go for it almost seemed a thing of life, and the showman's variety was a product of mechanical beauty.

The oil tractor, however, has one big advantage, viz., that it can be easily copied by the toy-maker—indeed model farm and haulage tractors of a very realistic kind are readily put together.

An Agricultural Tractor

Figure 1 shows a simple agricultural tractor of the type one sees pulling ploughs and other forms of cultivators. Bonnet and base are cut from one block of wood as (1). Below are secured the two strips (b) to take the wheels, while other items are the big driving and small leading wheels and the seat (c). The seat is cut from a single piece of wood as shown and is fastened to the rear edge of (a) in the recess (d)—a small screw being taken in from the back.

Wheels can be bought or cut from round rodding. It is perhaps better to purchase these items as wheels running out of true spoil any model and to strike the exact centre of a disc is not too easy. The wheels can be put straight on if steering is not required.

Moving Axle

If it is, then the front axle should be made as shown in the bottom sketch. In this case a single screw is put through the centre of the strip into (a)—the strip then being worked a bit till it swivels easily. The axle must be a little wider than with the non-steering model to allow of the front wheels turning from side to side.

The steering wheel (k) in front of the driver's seat is only imitation, and is made from a disc of card or plywood, bored and glued to a short stem which in its turn is secured to the back of the main body with a small staple. A hook is fitted in the back edge of the base for the purpose of attaching other vehicles, such as a farm cart. A small square hook will do nicely for this.

The model can be left in plain wood if well glasspapered and if nice material has been used, or it can be painted in green and red or grey and

red. No dimensions have been given in the diagram as the model will probably be made to agree with some existing trailer by which the size will be settled.

A Road Tractor

The second diagram shows another type of tractor which is seen about a lot. It is a kind which is used for short-distance road haulage and has a cab to protect the driver from adverse weather conditions. Timber yards often possess this type of tractor and a trailer loaded with imitation cut planks would form a very nice complete set.

Here the extension of the main block which forms the engine and base is longer, as it has to take the section (f)—which is the back and cab seat in one. It rests on top of the base and is held by screws from below.

The top of the cab is a single rectangle as (g) and is held to the upright by thin nails or screws. So that the joint may be firm, the width of the back should not be too narrow. To give plenty of purchase for the wheel screws, the two strips (h) are attached as with the farm tractor, these being held with screws from the under side. The lower bottom left-hand sketch shows the parts assembled.

Again, if steering is required, the axles must be made a little wider and the front one shaped as the bottom right-hand diagram.

The model is finished with the coupling hook at the back, and if desired a hook in the front to attach a draw string. In both the farm tractor and this model it should be noted that the top of the bonnet is bevelled down both edges, as this helps to give a realistic appearance.

Tractors of this second type are usually rather more elaborately painted than the agricultural variety. Green is a very popular colour with some lines put in, and if possible a finish of this nature should be attempted.

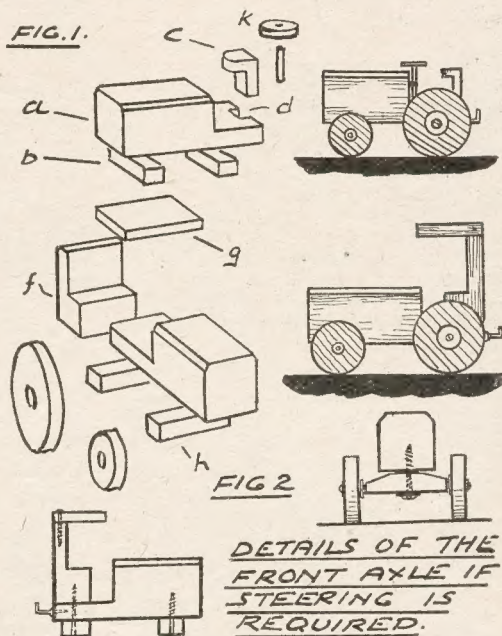
Various Types

The making of model tractors offers a good scope to the handicraftsman for there are literally scores of types of these machines about the country from which to copy. Thus, there is a farm type which runs on two large back wheels but with a single wheel

in front or two set very close together right under the bonnet.

Some tractors, too, carry a short exhaust pipe, set like a chimney, in front to carry the exhaust gases above the driver. Different types vary also in the relative size of the driving and leading wheels but the sizes given in the sketches are about correct for the machines depicted.

One final word. When fitting disc wheels made of wood always fit washers on the inside and outside as this helps smooth running and assists in keeping the wheels true for a good period of time. With metal



wheels, washers are not quite so essential.

You will possibly see the different types in the country districts around you and should be quite able to copy them as simplified models. Or pictures in catalogues will be helpful to you for the same purpose.

About Wheels

Tractor wheels, incidentally, generally have a fairly wide tread so that they will not sink into soft soil, while many are rubber tyred. The correct appearance can be given with cut disc wheels by making them on the wide side while a variety of widths can usually be obtained in the bought kind.

If the toy being made is of the road haulage type only, rubber-tyred wheels can be bought to give greater realism, but these of course are rather more expensive than the plain disc type.

How to treat the back of the layout in building MODEL RAILWAYS

MOST model railway layouts are built against a wall along their longest side, and it is often very difficult to arrange scenery effectively to cover the large vertical surface which is exposed behind the railway proper. Admittedly, painted scenery—either in the form of hand-painted work or cut-out posters—may be used, but in such cases the amount of scenery required would be very expensive or the posters would be difficult to blend into one uniform scene.

A Dummy Background

It is much better to build up a dummy background from plywood or cardboard, topped with either fencing or trees, to give the effect of the line running in a one-sided cutting such as would occur on the side of a small hill. This produces the appearance shown in the appended photograph, which is of a Great Western station in Devonshire.

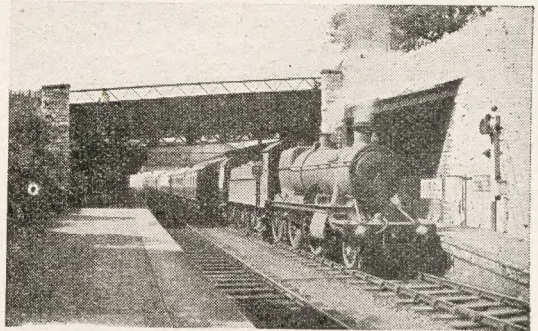
It will be seen that the further platform flanks the rock-built retaining-wall, at the top of which runs a roadway parallel with the railway. This road turns slowly left till it crosses the line by the girder bridge;

to modify some of the angles, but in Fig. 1 is shown the plan view of the picture, and in Figs. 2 and 3 the end elevation (across the railway tracks) and the front elevation (looking towards the back of the model baseboard.)

The arrangement of the back platform could be reduced still further in width by making it integral with the sloping retaining wall, the latter even supporting a platform awning for part of its length, if desired.

The two girders forming the sides of the bridge should be about 4ins. deep, with $\frac{5}{8}$ in. by $\frac{1}{2}$ in. stripwood for the main horizontal members and $\frac{1}{2}$ in. by $\frac{1}{8}$ in. stuff for the cross girdering. The main girders should first be made, using a simple jig to ensure that both girders are identical, (Fig. 4). After which each girder should be screwed to a piece of $\frac{1}{2}$ in. board which does duty as the roadway (A, Fig. 3).

It will be found best to carry the



A useful station prototype on the West Region, in Devon

The piers and buttresses are nailed to the sides of the roadway at the points X and Y (Fig. 3), thus making the bridge a unit in itself which may be suitably fastened to the rear wall of the railway room or to the back-board of the layout, being held therefrom by a spacing piece of 2in. by 1in. (P, Fig. 2).

Girder Work

After the bridge has been secured in place, the short piece of skew-girder (G, on Figs. 1, 2 and 3) may be inserted. The sloping retaining wall is saw-cut from M to N (Fig. 3), to allow for bending the piece of wall forward where it rests on the girder beneath. The slope of the wall backwards should not exceed $2\frac{1}{2}$ ins.

The mounting of the main cross girders in place, calls for a word as to headroom (i.e. the distance in a vertical direction between the surface of the rails and the underside of the roadway). In 'O' gauge this should not be less than 6ins., and in 'OO' gauge about $3\frac{1}{2}$ ins. In each scale, an

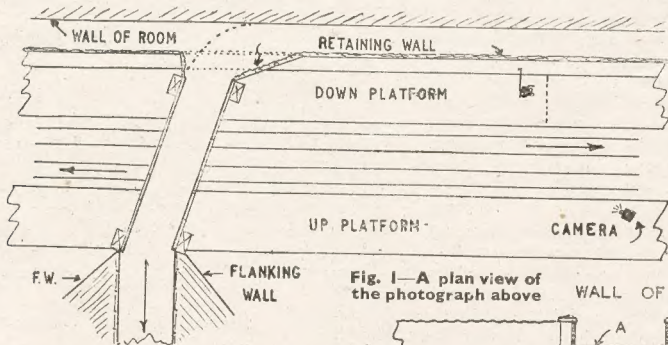


Fig. 1—A plan view of the photograph above

being partly supported during its curve to the bridge by the overhanging girder (immediately above the smoke-box of the engine) which carries the roadway footpath.

To translate such a scene into model railway practice it is necessary

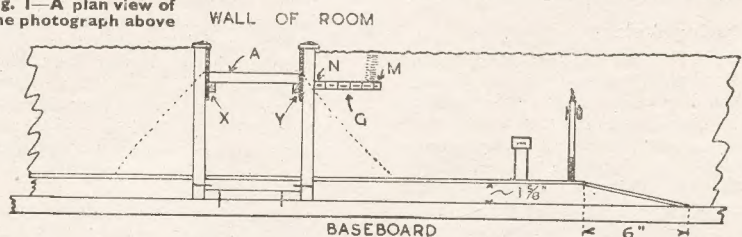


Fig. 2—Looking across the tracks, with detail of bridge and platform

main buttresses right down to the actual base-board of the railway, cutting in the station platforms around their bases. If the buttresses are nailed to the platforms, a very weak job will be produced.

approximation can be made by placing the highest item of rolling-stock on the track and fixing the bridge so there is about $\frac{1}{2}$ in. clearance between it and the vehicle or engine.

The station platforms may be made up from $\frac{1}{2}$ in. plywood or even thick millboard, either of these surfaces being mounted upon lathes on edge (L, Fig. 2). The laths should be previously planed down so the distance between the baseboard of the

(Continued foot of page 303)

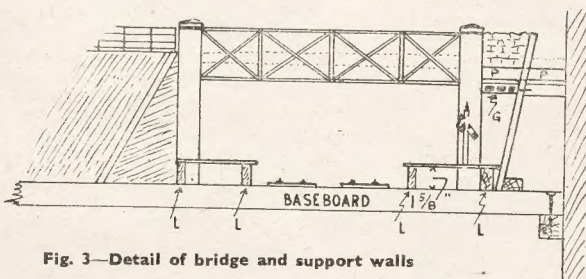


Fig. 3—Detail of bridge and support walls

For those who live near a broadcasting station here is the SIMPLEST CRYSTAL SET

MOST people at one time or other reach the stage of making a crystal set, if they are at all interested in radio. This one aims at being cheap and reliable; indeed, it might almost not be called a crystal set at all, for as can be seen, it is shown using a safety razor blade as a detector! As many readers will know, razor blade 'crystal' sets were used by British prisoners of war in prison camps on the continent to listen to home news bulletins.

Before starting to make a crystal set it is necessary to be sure that you live in one of the areas where there is an ample signal from a local station. In other areas of the country it is more profitable to start at the stage of making a one-valve set.

30-Mile Reception.

If there is a broadcast station within thirty miles, then it will be possible to get that particular programme clearly, while more erratic reception is possible at much longer distances. When made, the set is

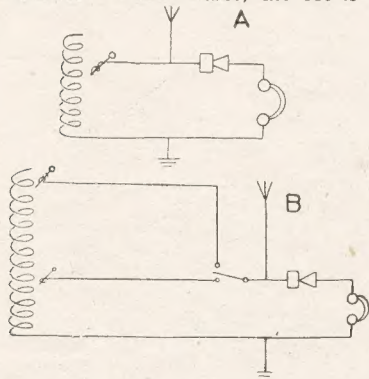


Fig. 1—The two circuits

ideal for listening in bed—the main danger being of bringing the set crashing off the bedside table when one goes to sleep and in turning over tugs at the phone cord!

The requirements for the set are

shown in the illustration. The wire should be fairly stout cotton-covered material—to be got from old coils or radio shops. The terminals can be dispensed with at a pinch, and four nails with the bare wires wound round will do as well.

The cardboard cylinder for the coil can be part of a postal cylinder, or even the centre of a toilet roll—the number of turns depends upon the diameter of the former, as shown in the table set out here.

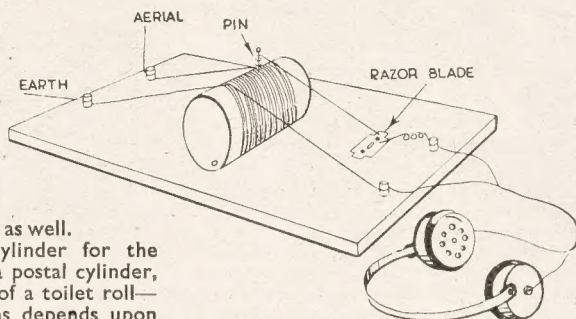
The headphones and the standard crystal detector, which can, of course, be substituted for the razor blade, are the most expensive items. Government surplus headphones are, however, fairly cheap and generally good.

Wind the wire neatly on the cylinder, threading it through pin-holes at the ends, so as to secure it. Then mount the coil as shown, connecting the nearer end of the coil to earth and one side of the headphones. The other wire goes from the aerial (is bared where it is wound several times tightly round the pin) then goes to the razor blade or crystal. The other side of the phones is connected to a piece of copper wire which touches the blue material on the razor blade or the crystal.

Detector and Tuning

If an unmounted crystal is bought, it can be set in a small bakelite flashlamp-bulb socket, using silver paper for bedding it down. Many minerals will act satisfactorily as detectors. Iron pyrites (Fool's gold) which is sometimes found as golden crystals in coal, works well.

Tuning is accomplished with the pin. When the set is ready, push the pin amongst the coil turns, making sure that the insulation of the wire touched is pierced. Then move the cat's whisker about on the crystal or



razor blade. As soon as you hear the programme, however faintly, stop and adjust the position of the pin along the coil for the best tuning point.

Some readers will live near enough to Droitwich to be able to hear the long wave light programme as well as one of the medium wave regional stations at satisfactory strength. By purchasing a single-pole double-throw switch and winding three times as many turns on a longer former, they will be able to find separate tapping points for the two programmes.

If they fix up the circuit shown in Fig. 1B, they will be able to select either programme rapidly at will.

DIA. OF FORMER	NO. OF TURNS
1½ ins.	80
2 ins.	70
2½ ins.	60
3 ins.	50

Readers near two different medium wave stations may get programme interference which is one of the unavoidable faults of crystal sets.

In spite of its simplicity this set is much more than a toy and deserves good wire connections and as long an aerial as possible, combined with a firm water-pipe earth. It will then give endless good quality reception of the local station.

Model Railways—(Continued from page 302)

railway and the underside of the platform surface is 1½ in. ('O' gauge). The sloping ramp at the platform ends should be not less than 6 ins. long to look effective.

There are many methods of treating the roadway as it comes towards the front of the layout in the direction of the arrow in Fig. 1. Probably the simplest and most effective is that of bringing it down to the level of the railway baseboard on an embankment, the end of which is supported where it meets the bridge by the flank walls seen in Figs. 1 and 2, and shown

dotted in Fig. 3.

If, however, the layout is not too wide, and its narrowness would necessitate the roadway slope being too great, then the actual bridge itself could be tilted. Make the front piers, say, 1 in. shorter than the rear ones. If this is done, care must be taken to ensure that adequate headroom is left for passing trains on the track immediately under the lower end of the track.

In matters of finish, there is no difficulty in obtaining 'brick' and 'stone' papers from any model supply

stores at the cost of a few pence per sheet. Blue brick paper should be used for the platform fronts and stone (light) paper for the rear retaining wall, where brickwork would look completely out of place—in Devonshire, at least.

The surface of the platforms should be painted with a very dark brown paint to which a little sand has been added to give a gritty, matt appearance. Platform edges may be whitened if desired, or treated light stone colour and scribed into flag-stones with a soft pencil-point.

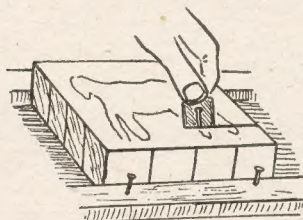
Any youngster will be delighted if you make and give SMALL PICTURE BLOCKS

THE square type of blocks which put together correctly, made pictures, were at one time very popular with youngsters but of recent years, probably due to war shortages they seem to have fallen into obscurity. There is a part of a picture on each face of each block and as a cube has six faces, six pictures can be made up.

Blocks like this are very easy to make, accuracy in finish being the main thing. As sold, the blocks are in a box with lid but just as much fun can be got out of them if merely placed on a simple tray having a lip all round, inside which the pictures are arranged.

Suitable Size

A good size for each cube is $1\frac{1}{2}$ ins. but blocks of a greater or less dimension could be made. Assuming that a $1\frac{1}{2}$ in. block is to be used, a piece of wood, $6\frac{1}{2}$ ins. by $6\frac{1}{2}$ ins. by $1\frac{1}{2}$ ins. is required—the extra $\frac{1}{2}$ in. being neces-

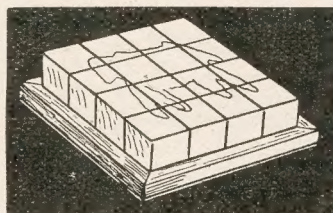


Cutting the pictures

sary to allow for the saw cuts and glasspapering down. This is marked out as shown and then carefully cut.

Here the greatest accuracy is required, although absolute similarity of size is secured later with a glass-paper block. If not working with any outside mechanical aids to give the saw a dead true action it is best to cut half through and then turn the block over and cut right through from that side. This means that the edges of the blocks will be quite accurate and any inequality left in the middle can be taken away by rubbing.

Having separated the pieces, clamp them together temporarily with side strips nailed to a board and obtain a dead true finish with the blocks lying in any position. That is to say, it is



not sufficient that just the upper and lower surfaces of the original piece of wood be well smoothed, but the blocks must present a perfectly level surface no matter which faces are turned up. To effect this, it is best to keep turning the blocks over in rows as the glasspapering proceeds. Any very obvious inequality should of course be dealt with by a small plane or sharp chisel.

Adding the Picture

Having got the blocks made, the next thing is to put on the pictures. Now-a-days well-coloured pictures are not hard to obtain as many of our weeklies print some really fine pieces of work.

A picture must, as it is or trimmed, lie nicely in the $6\frac{1}{2}$ in. square frame and it is secured to the wood by glue. To do this, the blocks are again clamped tightly together and the upper surface rubbed well with tube glue that is not too thick. The picture itself is then placed face down on something firm and also given a good application.

The picture is now placed on the blocks and smoothed well down. This is best done by laying on a sheet of clean blotting paper and then running over the surface, always in one direction, with a photographic squeegee. If there is not one of these handy, the smoothing can be quite well done with the fingers.

Pressure should then be applied in the form of a flat piece of board with a weight on top and everything left until dry. It is very important that no cutting should be attempted till the glue is perfectly dry or there will be a danger of the paper jaggling at the edges.

Separating the Blocks

When completely dried out, the blocks are separated by running a safety razor blade between each, the blocks still being clamped together and the picture uppermost. The blade should be held almost vertically and worked up and down with a gentle sawing action.

Do not press it forward to any extent but let it rather eat its own way through. Working in this manner it will be found that a very clean edge

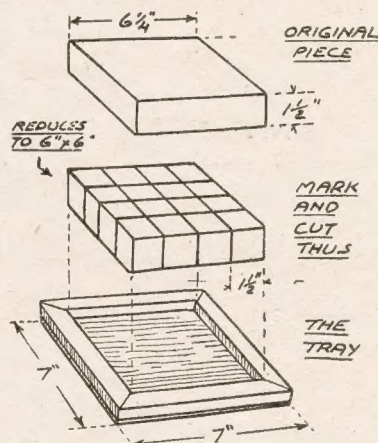
can be obtained to each block, which is important if a good finish is desired. The blade, of course, must be very sharp, a dulled edge being worse than useless.

Pictures Each Side

Now turn the blocks over and put on a second picture, and so continue till all the faces are covered. This may seem a rather lengthy process, but actually glues of the tube kind dry out very quickly and as they contain very little free liquid there is never any question of the picture becoming really wet.

In most of the old-time sets, the pictures were placed rather too regularly. That is, if the top picture was made it was known that the picture on the other side was also made up, and this could be got at once by merely turning the whole lot over.

More interest is given therefore if, after putting on the first picture, the blocks are completely shuffled before putting on the second. Thus, one or two might be turned on their



How the work proceeds

side, others turned right over and some twisted round in the other direction. Thus every picture will have to be made up individually, and the setting up of one no help in getting the others in order.

Finally comes the tray. This is a sheet of plywood 7 ins. square, having round its edges a strip of $\frac{1}{2}$ in. square section wood, held by small screws taken up from below.

It can be polished only or stained and polished but should be given a bright finish. If being given as a present, blocks and tray will look well wrapped in a sheet of cellophane which, as well as giving a bright appearance, will hold everything together for the time being.

CORKS FOR PEDALS

If the rubber of your cycle pedal becomes broken and lost a substitute can be made with corks, which will last quite a long while. Extract the spindle of the pedal and thread through a hole bored centrally in the corks. Replace the spindle and you will have a lasting and comfortable pedal grip again. All corks should, of course, be the same size.

Books to Read!

In view of the wide range of problems we are asked to solve in letters from readers we recommend a note to be taken of these recent books published. They are obtainable from booksellers in the usual way or direct from the publishers if you mention Hobbies and add postage.

The Woodworker's Pocket Book

by Charles H. Hayward

A REALLY handy book for any woodworker—amateur, professional, or even the home handyman. It is a veritable encyclopædia of facts and the ideal book to keep handy to solve those problems or answer the questions that arise, and which usually prove so difficult to deal with. For instance, could you mark out a hexagon right away? Well, here is how—with other simple geometrical outlines. If you were asked whether a certain known board was soft or hardwood in character could you answer? A special long list is given of both with botanical and working particulars, source of supply, weight and general uses. The whole book is packed with data, drawings and details of interest, usefulness and lasting value. Its author is a well-known authority and writer so he knows thoroughly, and has here published helpful hints on all those matters which arise in the average home craftsman's dealings with wood. Published by Evan Brothers Ltd., Montague House, Russell Square, London W.C.1—Price 5/-

The Amateur's Dark-room

by T. Dalby

AS more and more amateur photographers process their own films, so they will turn to books like this for helpful information. How to fit up a cupboard, a corner of the kitchen, the bathroom, or the spare-room are all dealt with, apart from working methods, fitments and accessories. The question of providing room and equipment is often a bugbear to the budding photographer, but these pages deal with the subject from the angle of an ordinary man who wants to do things—and without incurring the wrath of wife or mother. Limitations are realized by the author and his advice for overcoming them will do much to earn the thanks of those keen amateurs who carry on, whatever the difficulties.

Published by The Fountain Press, 46/47 Chancery Lane, London, W.C.2—Price 2/-

Practical Building Repairs

by R. Greenhalgh, A.I.Struct.E.

INTO the 384 pages of this book an amazing amount of information has certainly been crammed—dealt with

by experts on the various subjects. It is absolutely comprehensive, and whilst particularly appealing to the professional builder or a beginner or apprentice, it is equally helpful to the handyman, or owner who wants to know about his property repairing. Chapters deal with all parts of the house fabric, with the drainage, lighting, plumbing, etc., and even to fencing and outside work. A particular helpful chapter covers the difficulties of war damage, and the vast intricacies of building regulations. The 300 drawings really do illustrate whatever point is being explained—whether glazing, fastening screws, conduit connections or treatment of dry rot. Apart from a lengthy index a point of appeal to us was that each right page is headed with the contents of that page, so that a quick glance through proves an easy means of finding what is wanted.

Published by Odhams Press Ltd., Book Dept., Long Acre, London, W.C.2—Price 8/6

Alphabets of Signwriters, Artists and Illuminators

by F. Delamotte and J. A. Ainslie

SO many of our readers are really clever with pen and brush, we are sure they will be interested in this new book. Each of its 61 pages contains only large and clear examples of some particular form of alphabet, of Continental as well as English style. There is none of the plain, severe style of modern printing, because the user will obviously be called upon to

use something more purposeful and ornate. Many would not do for the ordinary occasion of decorating or illuminating, of course, but such a wide range of lettering is given that there is choice for whatever job in hand, from the blackness of Italian to an example of the beautiful 16th Century Vatican alphabet. The fact that this is the revised 19th edition is proof of the excellence and continued popularity of the book.

Published by The Technical Press Ltd., Gloucester Rd., Kingston Hill, Surrey.—Price 6/-

Leathercraft

by Robert L. Thompson

RECENT articles in these pages on the subject of Leathercraft have proved the popularity of the hobbies and this book should be in the hands of all those who take the pastime seriously. It is undoubtedly a profitable one if you want to make it so and can turn out work of a high standard. How to do so is shown in the pages of this book for its very legible type and clear photographs provide all necessary instructions. Following a short history of the craft there are chapters on progressive work from simple objects to beautiful carved and embossed handbags, belts, book covers, etc. Complete details for making a practical object are dealt with in each chapter. The only difficulty at present is in obtaining suitable material for the hobby, but it is becoming more available at specialist craft shops and art departments of the larger stores. Published by Macmillan & Co. Ltd., St. Martin's Street, London, W.C.2—Price 10/6

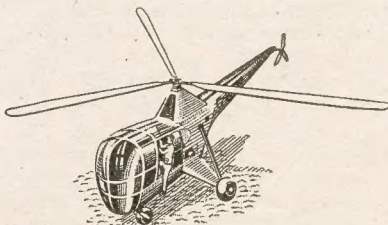
Forty Power Tools you can Make

THE modern trend for the home craftsman is to utilize the small and efficient fractional horse power with his fretsaw, or circular saw or lathe, etc., and so save a considerable amount of hand or foot labour. The manner in which such motor, connected up to the ordinary house lighting circuit, can be utilized has been exploited for the home handyman in the U.S.A., where such power units are easily obtainable, and a really surprising range of opportunities are provided. This book has photographs, drawings and instructions for fitting up a motor to a lathe, a sander, a small bandsaw, and a drill, to

(Continued foot of page 306)

A SMALL MODEL HELICOPTER

THIS simple non-flying model is built in wood with fuselage 4½ ins. long and made from patterns and instructions on Sheet No. 2786, with this issue. Wood, wire and rod are in a kit from Hobbies Branches for 1/- or for 1/6 post free from Hobbies Ltd., Dereham, Norfolk.



Now you can add a second cut-out novelty by making this CRICKET WALL FIGURE

CRICKETERS, and those interested in the sport, have the chance this week, through this article—the second of a series on sports to be published—to make themselves the novel wall statuette shown herewith.

The outlines of the statuette shows a batsman in action. He is making a run and is looking back anxiously in case he is run out by some fast fielder—which is just the sort of incident ideal for our purpose, for it introduces excitement.

Any cricket team would be delighted with such a novel and simple ornament for the wall of their club room. College youths and schoolboys will certainly want one for their studies and dens.

Shelf Construction

The construction of the shelf for the statuette is very simple. It consists of a $\frac{1}{4}$ in. thick wood back, the shelf itself and semi-circular supporting pieces which are included more for ornamentation than usefulness.

As usual, the back—to save space—is shown half the complete shape (see Fig. 2) and must, therefore, be drawn up complete to the dimensions. The

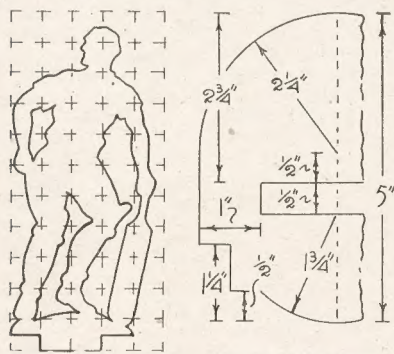


Fig. 1—Outline in $\frac{1}{4}$ in. squares

Fig. 2—Half shape of back

compasses are used where indicated by the arrows, same pointing from a central position to the radii lines.

Having cut out the back, cut out the shelf piece (Fig. 4) from $\frac{1}{4}$ in. wood and glue it in place. The semi-circular pieces are also cut from $\frac{1}{4}$ in. stuff. The largest piece is half of a $2\frac{1}{2}$ in. circle and the smaller piece half of a $1\frac{1}{2}$ in. circle.

Glue the former beneath the shelf, then add the other on top. Be sure to have all roughness removed with coarse and fine glasspaper. The work is enamelled or polished any way convenient.

The Statuette

The statuette is marked out in $\frac{1}{16}$ in. squares and traced to $\frac{1}{4}$ in. or $\frac{3}{16}$ in. or $\frac{1}{2}$ in. thick plywood and then cut out with the fretsaw. Details of the

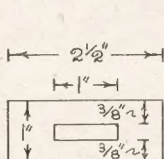


Fig. 3—The base

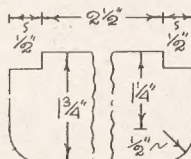


Fig. 4—The shelf

base piece are given at Fig. 3.

Glue this to the statuette. If the shelf work has been enamelled bright green or blue, the statuette could be coloured grey, this also applying to its base.

The usual alternative is to coat the work with liquid gold or silver paint, then protect this finish with a coat of shellac varnish—clean pure stuff only.

When this has dried, one might cover the base with a piece of green baize, but this is not really necessary, for the statuette is light in weight and cannot scratch the shelf surface unduly, if at all. It is, of course, a different matter if you convert the statuette into a paper weight.

To do so, incidentally, you merely require some lead piping or sheeting.



With the former, the base shape is cut in a scrap piece of wood of adequate thickness.

The wooden "mould" is then nailed to another piece of wood. The lead is melted in a tin and poured carefully into the mould until flush with same. The lead sheeting permits cutting the shape out with a fretsaw; it is held with small flathead screws.

The next plaque novelty we shall offer is for a similar type of article showing a tennis player incorporated in the silhouette.

MATERIALS REQUIRED

- 1 piece fretwood (statuette) — 6ins. by 3ins. by $\frac{1}{4}$ in.
- 1 piece fretwood (base)—3ins. by 1 1/2 ins. by $\frac{1}{4}$ in.
- 1 piece fretwood (back)—5 1/2 ins. by 5ins. by $\frac{1}{4}$ in.
- 1 piece fretwood (shelf)—3ins. by 2ins. by $\frac{1}{4}$ in.
- 1 piece fretwood (support)—3ins. by 2ins. by $\frac{1}{4}$ in.
- 1 piece fretwood (support)—2ins. by 1 1/2 ins. by $\frac{1}{4}$ in.

Books—(Continued from page 305)

name only a few. As motor units become more plentiful the keen home craftsman can fit up a marvellous modern workshop by utilizing the suggestions made.

Published by Taylor Publishing Co., Sedgeford, Norfolk.—Price 12/6

The Book of Crafts

by F. T. Christopher

THIS is a handy pocket size paper-covered book of 60 pages covering a very wide range of subjects which must interest our readers. Short details are helped out with line drawings and photographic illustrations for some usual and some unusual pastimes which appeal to the

home craftsman. There are such crafts as painting in colours on jugs, glasses and similar household ware, making lampshades, plaster casts of living faces, puppet making, flowers in felt, basketry, etc. A handy little book, full of helpful suggestions.

Published by Bear Hudson Ltd., 63 Goldhawk Rd., London, W.12—Price 2/-

A Ship in a Bottle

by Clive Monk

MOST of us, at the seaside, or Mantique shops, have gazed in wonder at a full rigged sailing ship standing erect on a turbulent sea, inside a bottle and endeavoured to work out how it could be done. The

art was originally practised by old-time sailors in their spare time aboard ship, and most of the results now adorn shops or homes as novel curiosities. The making of them is more simple than first appears, but demands little material, much patience and no little ability with nimble fingers. The result, however, is well worth the conquest and the intriguing object never fails to excite admiration. Diagrams, pictures and letterpress give complete details for building a beautiful specimen inside the bottle, so anyone really interested can be assured of satisfactory results. Published by The Studio Ltd., 66 Chandos Place, London, W.C.2 — Price 3/-

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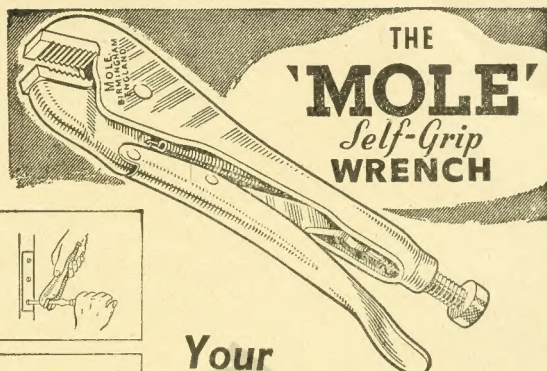
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Dept. 3

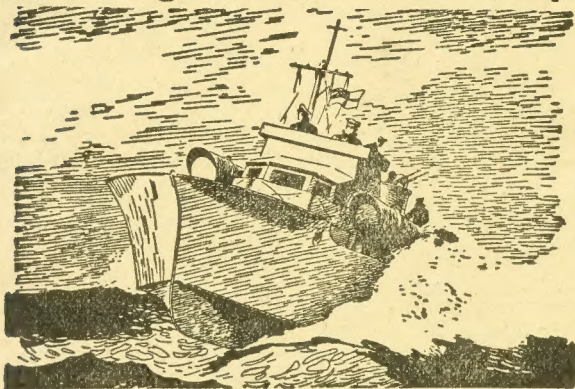
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